

**Kodiak Regional Aquaculture Association's (KRAA) Special Use Permit Request
Q&A on Final Decision and Environmental Assessment**

1. Why did KRAA submit a proposal to Kodiak NWR for a special use permit to conduct nutrient enrichment of Karluk Lake?

Karluk Lake is the largest lake in the Kodiak Archipelago and its watershed supports all five species of Pacific Salmon. Between 2008 and 2011, the early run of Karluk Lake sockeye failed to meet the Alaska Department of Fish and Game's (ADF&G) minimum escapement goals. ADF&G attributes the decreased runs to a number of factors, including over-escapement between 1985–2007, which resulted in large numbers of juveniles that overgrazed and reduced the food (zooplankton) available for future runs. The Service has management responsibility for habitats within Kodiak NWR and so, in 2012, Kodiak Regional Aquaculture Association applied for a special use permit from the Kodiak National Wildlife Refuge (Refuge) to conduct nutrient enrichment (fertilization) in the Karluk Lake watershed within the boundaries of the Refuge.

2. Why did the Service conduct an Environmental Assessment?

Under the National Environmental Policy Act, the Refuge is required to assess the potential impacts of the proposed action and alternatives. In response to KRAA's proposal, the Refuge began discussions about the project with KRAA and a planning team was formed by the Service including agencies/organizations with management responsibility for fisheries (ADF&G) and lands surrounding Karluk Lake (Koniag, Inc.).

3. What specific areas of concern did the EA evaluate?

Early scoping with ADF&G and Koniag, Inc., identified eight specific areas of concern that the EA evaluated prior to selecting an alternative:

(1) The primary concern regarded aquatic productivity and its relationship to sustainable salmon populations, and included the following questions:

- a. Is nutrient deficiency in Karluk Lake an issue?
- b. Is the variability of nutrients outside of historical ranges?
- c. Is there an adult sockeye productivity issue?
- d. Is the current sockeye salmon run size adequate to achieve self-sustaining populations at historic levels?

The other seven concerns were: (2) other fishery resources, (3) wildlife, (4) water quality, (5) subsistence resources, (6) refuge recreation, (7) socioeconomics of local communities and individuals, and (8) effects to cultural resources.

4. What alternatives were considered in the EA?

The Environmental Assessment (EA) evaluates the environmental and management consequences as well the effects on subsistence uses of KRAA's proposed fertilization. The EA contains four alternatives: A) No Action: continue current management; B) KRAA Proposed Action: Fertilization — apply aqueous phosphorus and nitrogen to the surface of Karluk Lake over the period of five years, as needed, to increase phytoplankton; C) stocking fry in Karluk Lake over the same five year time period; D) a combination of stocking and fertilization.

5. What Alternative was selected and why?

The Service selected Alternative A: Current Management (No Action). Current Management contributes to sound fishery management by maintaining high quality habitat with minimal human interference, and best accomplishes the goal to conserve the abundance of natural salmonid populations for continued human and wildlife use, protecting their genetic diversity within the Karluk watershed.

During the evaluation process, we carefully considered KRAA's complex proposal and the other proposed alternatives. We reviewed the best available science, ensured consistency with Service laws, regulations and policies and the 2008 Refuge management plan, and considered public input to ensure a sound decision. We also evaluated the proposed action to determine if there was a demonstrated need and likelihood of success. The selected alternative is based on the latest available science and best meets the statutory mandates of the Refuge System Administration Act (as amended, 1997) and the Alaska National Interest Lands Conservation Act (ANILCA), furthers the Refuge purposes and management direction in the 2008 Comprehensive Management Plan, and complies with the Service's Biological Integrity, Diversity, and Environmental Health (BIDEH) policy.

6. How was the public involved in the decision process?

On December 4, 2014, the Service released the draft EA for a 60-day public review and comment period, with a request for any additional information, corrections, or alternatives that should be considered in the final EA. We notified the public through informational postcards, a Notice of Availability in local newspapers, posting on the Kodiak Refuge website, and an open house in Kodiak on January 13, 2015. In addition to discussions during the open house, we received 39 written comments. Both individuals and organizations submitted comments; concerns included the nature of the proposed action, the potential social and economic effects of reduced fish numbers; the status of Karluk sockeye salmon and need for the project; overall lake productivity and past enrichment efforts; sockeye management by ADF&G; concern about the resources at risk in the Karluk basin; and concern over whether the proposed action was compatible with Refuge purposes. Where appropriate, changes were incorporated into the final document.

7. Why did the Service not select Alternative B: KRAA's Proposed Action?

KRAA proposed to restore productivity to Karluk Lake through nutrient enrichment. Under the Management Policies and Guidelines in the current Kodiak NWR Comprehensive Conservation Plan (CCP), the Refuge uses criteria to evaluate the need for fishery restoration in a minimal management area. Criteria include: to provide self-sustaining fish populations where fishery resources are severely adversely affected, use strategies that are least intrusive to the ecosystem, and maintain the genetic integrity of the depleted population. Karluk Lake falls exclusively within a minimal management area of the Refuge, where we allow habitats to change and function

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primarily through natural processes. After evaluation, the Service determined that the Karluk sockeye salmon stocks were not “severely adversely affected” and were within their historic range of abundance and therefore restoration was not needed.

8. Why did the Service conclude that the Karluk sockeye stocks were not “severely adversely affected”?

After examining the long-term record, the EA found that the Karluk sockeye runs are within historical range of abundance. Karluk sockeye runs are highly variable; data show that stocks are cyclical and have demonstrated resilience to low years. An estimate of historical salmon escapement into Karluk Lake over the past 2000 years shows large cycles. Weir data shows escapement fluctuating between 200,000 and around 1.5 million fish after the 1920s. Since 2012, the sockeye salmon returns to Karluk Lake have trended upwards and have met the escapement goals for both the early and late sockeye runs.

9. How did the Service evaluate the proposal for likelihood of success?

To predict the likely success of the proposed fertilization project, the Service looked at results from the enrichment project conducted in the 1980s. There was insufficient monitoring data collected to attribute an increase in sockeye salmon returns to this nutrient enrichment work. Total Karluk sockeye returns began to rise in 1982, peaked in 1991, and have continued to fluctuate with another peak in 2003. We can use current research on productivity and returns to better understand the context of this system. Researchers in 1998 concluded that salmon carcass deposition was the most important driver of lake productivity for the increased return that began in 1982, prior to the fertilization project. In addition, the cyclical variation in salmon returns in the Karluk was similar to other non-enriched systems between 1981 and 1997.

10. How does the selected Alternative support the resilience of Karluk sockeye?

Maintaining high quality habitat on Kodiak Refuge is of paramount importance; we want to proceed with caution when considering proposals to intensively manipulate the lake environment. Karluk sockeye are comprised of at least 23 distinct genetic populations within two managed sockeye salmon stocks. This genetic variability allows Karluk sockeye as a whole to be resilient to changes in environmental conditions, with some populations flourishing under certain environmental conditions, while others do not. Protecting multiple, diverse sockeye salmon populations in the Karluk watershed provides for a more reliable fishery for people and wildlife. Current management poses the least amount of risk to this complex system.

11. What does the Service expect from continuing current management (No Action Alternative)?

The Service expects that the Karluk stocks will continue to fluctuate, with some years of low abundance, due to the inherent complexity of the system. Total returns vary over time due to many environmental factors, including lake, river and marine habitat, as well

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as human factors such as harvest. Like most Alaskans, we value healthy, wild salmon and salmon habitat, and recognize how important they are to the surrounding communities and to other critical wildlife in the area. The Service will continue to work with ADF&G to manage habitat at Karluk Lake to protect and provide for fish, wildlife and aquatic resources and to better understand and maintain the genetic diversity found in the “fishery portfolio” described by Schindler and others (2010). A special use permit for nutrient enrichment will not be issued to KRAA.

